

WELL DEVELOPMENTS

No. 22 Board of Water Well Contractors

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WELL LOCATION IN SUBDIVISIONS

The Department of Environmental Quality (DEQ) has asked the Board of Water Well Contractors (BWWC) to make certain that subdivision information is available to all licensed persons engaged in water well construction. Eric Regensburger of DEQ, who is a BWWC member, submitted the following information for this newsletter.

The primary reason for requiring a specific location for wells is to ensure that the required setbacks from potential sources of contamination (drainfields, for example) are maintained. In addition, practically every new

septic system/drainfield that has been submitted for subdivision review since April 29, 1993, has a mixing zone into which a new well cannot be drilled and existing wells must maintain 100 foot separation, per *Administrative Rules of Montana* (ARM) 17.30.508. (The size and location of the mixing zone depends on the lot size, septic system type, and direction of groundwater flow.) Therefore, if a well is drilled in an unapproved location, the 100-foot setback to the drainfield might be maintained, but the well may be located in the owner's (or a neighbor's) mixing

zone. Typically, when this happens, nobody realizes the problem, and the well may be at risk of sewage contamination. Alternatively, the landowner (or the neighbor) may have to change the location of the drainfield, which may or may not be a simple process.

While it is ultimately the responsibility of the landowner to make sure that the well is located in the correct location, many landowners are simply not aware that there is a legal requirement to drill the well in the approved location or have the location legally changed. Licensed well contractors can help get this information directly

to the people who need it.

DEQ is requesting that BWWC inform licensed well contractors of this potential problem. In addition, the board should also request that licensed contractors inform each of their customers of the legal requirements regarding the location of the well.

To reiterate, the department is not proposing that it's the contractor's responsibility to drill the well in the approved location (if the setbacks in ARM 36.21.638 are observed); rather, we request that the driller inform the owner of the responsibilities.♦

HELPFUL HINTS FOR NEW DRILLERS

We've had several requests to repeat the "Helpful Hints" data that was printed for new drillers several years ago and have selected several of the topics to be repeated in this newsletter.

WATER WITCHING
On occasion, you will be asked to drill exactly where an owner

had the well witched. It doesn't help either to argue or to agree. Your basic job is to drill where the owner tells you, because the well location is his responsibility. Drillers get into trouble when there is not enough water or the well is dry. Don't compound the problem by arguing about water witching or by promis-

ing water. Remember, your responsibility is to drill the hole properly and develop the water that you encounter.♦

MIXING CUTTINGS WITH BENTONITE
In the good old days, drillers used anything from mud to inner tubes to keep the hole from caving and keep circulation until the casing was

set. Bentonite was often mixed with anything, including drill cuttings, because it was commonly used in the oil fields and with mud rotary rigs. Older, experienced drillers still want to use a mix of cuttings and bentonite to seal the upper 18 feet of a water well or to puddle the mix behind driven casing. (more DRILLERS on Page 2)

DRILLERS

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However, Montana's rules prohibit mixing cuttings with bentonite.

Why? Because during the 1980s much testing of sealants was done. The results were variable, but seem to indicate that, although neither neat cement nor pure bentonite was perfect, they were indeed the best under most circumstances. Recent testing indicates that mixing cuttings with bentonite does not substantially affect hydration and sealing; however, under certain high pH and temperature conditions, bentonite does not hydrate effectively, particularly to shut out hydrocarbons.

So, there is no sealant that is best under all conditions. Pursuant to ARM 36.21.634(33), you are required to use a pure sealant of bentonite clay grout, neat cement grout, or neat cement grout with up to 5 percent, by weight, of bentonite clay.♦

PUBLIC WELLS

A "public water supply system" supplies at least 15 service connections or regularly serves at least 25 persons daily for a period of at least 60 days per year. DEQ has adopted specific and stringent standards for public wells as well as monitoring wells at landfills. The BWWC rules are minimum

standards that apply to all wells, public or private. If you are going to drill a well for a church, a restaurant, etc., you need to check with DEQ to see what additional standards may be required.♦

CASING

ARM 36.21.641A requires that all wells be completely cased to the bottom of the usable drill hole. Drillers that routinely drive steel casing into known local aquifers at always about the same depth often forget that, in different drilling conditions, sometimes the only way to case to the bottom is to use a liner inside the steel casing. In using plastic casing for liners, follow ARM 36.21.645 and also be aware that glued joints can emit an explosive gas that can be ignited by welding sparks that drop into the drill hole. Plastic screwed joints are available, as well as Cor-Loc casing and steel liners that can be welded.♦

DRY HOLES

The average family uses 5 to 7 gallons per minute (gpm) of water. Add a garden and a lawn, and the use increases to about 8 to 10 gpm. A comfortable water yield, if it is sustainable, is 12 gpm. Lending institutions may require a yield of 4 to 5 gpm for the property to qualify for a mortgage. A well yielding 1½ to 2 gpm can be developed for

minimal use by building a cistern for storage. Deeper wells can also store water for use during times of higher demand.

BWWC has found that complaints often center around a promise by the driller that there will be enough water, but it turns out that the water is not sufficient. Montana regulations require that, after you surge and clean the well, you bail or pump for a minimum of one hour. This only indicates that the well is likely to be sustainable. By pump testing the well until drawdown can be measured, the prudent well owner will know better how the well will sustain pumping. Many varieties, from geological conditions to cyclic precipitation changes, can affect recharge, so there is no set rule to go by. BWWC recommends that you follow the procedures in the rules

and inform the well owner that he or she would be wise to do more pump testing.♦

B E CAREFUL WHAT YOU SAY

Licensed drillers often forget that they work for a bonded water well contractor. At times they tend to be too confident in what they say to a well owner. This leads to misunderstandings regarding both financial agreements and well construction. BWWC receives many complaints because "the guy on the rig said that we would get good water at so many feet." Contractors need to make sure their drillers do not offer unsubstantiated opinions.

COMPLAINTS

Everyone gets complaints. BWWC receives nearly 200 complaints annually, ranging from drillers using foul language or

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CAN THE BOARD OF WATER WELL CONTRACTORS HELP?

Do not underestimate the assistance available from the Board of Water Well Contractors. It is far more than a regulatory body. The board has expertise from the drilling industry, both statewide and nationwide. The board also understands that a driller can get into situations that are very difficult to drill, develop, or fix properly.

When a driller calls the board and says he has a problem, the board can likely recommend a way to prevent a complaint, protect the aquifer, protect the well owner, and also protect the driller. A simple phone call asking for assistance puts the uncertainty at rest and will likely head off a complaint before it becomes a big problem.♦

DEEP-HOLING

The term "Deep-holing" means the driller drilled deeper than necessary to develop the water. Well owners often notice that the water level in the well rises to a higher level than the log indicates, and some may assume that the driller could have quit sooner and saved the well owner costs per foot. It is wise for the driller to know something about the depth of the aquifer and the depths of neighboring wells. He should advise the well owner that there is no guarantee that he will get water at that known depth.

because the aquifer does not always behave predictably. Further, water in aquifers is usually confined to an unknown degree and may rise in the hole after the aquifer is penetrated. Also there is no way to know whether the water is contaminated until it is tested. The board has investigated many complaints of deep-holing. Generally, the board considers the geological setting, aquifer data and well owner's desires in determining if deep-holing is subject to driller error.♦

DRILLERS

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destroying a lawn, to actual well construction violations. If you can't satisfy the well owner and it looks like trouble, it is wise to inform the BWWC office as to the nature of the complaint, so that it is not a total surprise. BWWC can likely resolve the complaint before it gets to be a personal vendetta.

Most complaints occur because of a financial misunderstanding. The board does not and cannot interfere in those business dealings. The board does get involved, however, if the allegation is about improper well construction methods.♦

ARTESIAN WELLS
Nearly all water wells are under some pressure after drilling and could be termed "artesian wells." "Flowing wells" are simply artesian wells that have enough pressure for water to flow out of the top of the casing. You are required to control a flowing well, which means capping it and installing a shutoff valve to shut it off completely. If it flows around the casing, you must pressure grout it until it is controlled or stops flowing. This is not easy and usually is a trial-and-error procedure. You can pressure grout inside the casing or blow a hole down outside the outer casing with air and water before grouting. You

can use different setting ingredients with the grout. Cement grout usually works best with some quick set additives. In any event, you

must control the flow, and thereafter it is up to the well owner to work out the amount of the beneficial use with DNRC regional office.♦

DISINFECTION

ARM 36.21.662, about disinfection, states:

(1) Sand and gravel used in filter pack wells shall be thoroughly bosed or sluiced with water, and shall be disinfected with a solution containing at least 50 parts per million chlorine before being placed in the well. All water introduced into a well during construction shall be clean and potable. The well and its equipment, including the interior of the well casing, shall be thoroughly swabbed and cleaned to remove all oil, grease, and foreign substances upon completion of the well's construction. Following the completion of a well, and again after the pump-

ing equipment has been installed, a well and its equipment shall be disinfected by thoroughly agitating and mixing in the well a solution containing enough chlorine to leave a residual of 25 parts per million throughout the well after a period of 24 hours.

(2) The responsibility for the chlorination of the well shall be agreed upon in writing by the parties to the drilling agreement.

(3) The contractor shall clean and disinfect the drilling equipment after drilling in an area of known or suspected contamination or areas of iron bacteria problems.♦

WELL LOG REPORT FORMS

The Water Resources Division of DNRC has appointed Chuck Brasen and Sheri Smith to evaluate and make recommendations for a new well form. The agency has experienced problems in well location data, well test data, handling complaints, global positioning system (GPS) data, soils descriptions, and processing the well logs.

Several in-house meetings have been held, and now Chuck and Sheri are seeking advice from all parties who use the well logs. If you have some thoughts on these problems, you can contact Chuck Brasen, c/o Kalispell Regional Office, Water Resources Division, DNRC, 109 Cooperative Way, Kalispell, MT 59903-0860.♦

CONTINUING EDUCATION SCHEDULE

The Montana Environmental Training Center (METC) has prepared its training calendar for 1999, and BWWC has recommended several courses that qualify as approved training for water well licensees. They are as follows:

Chlorine Safety, Design Maintenance and Repair for Water & Waste Water

February 3, 1999 Fish, Wildlife & Parks Dept. Near the Fairgrounds Miles City, Montana

Excavation Safety

March 23, 1999 *** Great Falls, Montana

Chlorination Operation & Maintenance & Variable Frequency Drive Applications

March 31, 1999 War Bonnet Inn 2100 Cornell Butte, Montana

Chlorine

April 20, 1999 *** Libby, Montana

April 22, 1999 *** Helena, Montana

Health and Safety Conference

May 4-6, 1999 *** Sheridan, Wyoming

Backflow Prevention

June 8, 1999 *** Kalispell, Montana

June 10, 1999 *** Missoula, Montana

The Board of Water Well Contractors and METC have discussed training sessions that may be more specific to water well and monitoring well construction. If you have suggestions for training, please contact Bob Radio at 444-6643 or Jan Boyle at 454-2728.

Most training schools by suppliers and manufacturer's begin in the spring of the year. You should contact your supplier for upcoming schedules.♦

For further information regarding the location of this training, call METC at 406-454-2728

Persons with disabilities who need an alternative, accessible format of this document should contact: DNRC, 48 North Last Chance Gulch,

P.O. Box 201601, Helena, MT 59620 — Phone: 444-6603/Fax: 406-444-0333/TDD: 406-444-6873

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